

Status of Restructuring: Wholesale and Retail Markets

PRESENTED TO

National Conference of State Legislatures

PRESENTED BY

Sanem Sergici, Ph.D.

June 26, 2018

THE **Brattle** GROUP

The views expressed in this presentation are strictly those of the presenter and do not necessarily state or reflect the views of *The Brattle Group, Inc.*

Agenda

Status of Restructured Wholesale Electricity Markets

- Overview and verdict
- Are the markets functioning?

Status of Restructured Retail Electricity Markets

- Challenges Faced by Retail Choice
- Importance of Retail Choice
- What Can Be Changed?

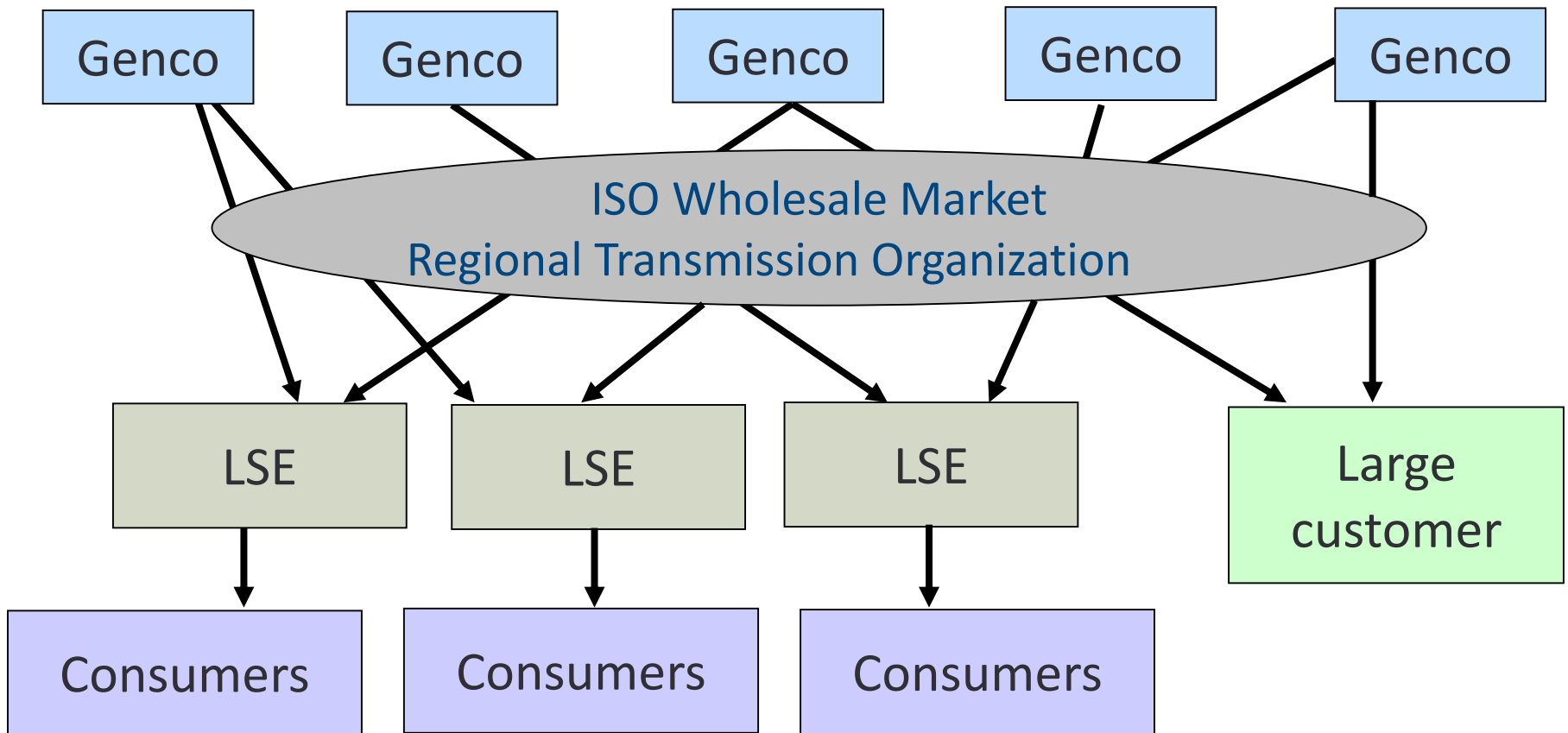
Restructured Markets - Wholesale

Restructured Markets – Regional transmission organizations (RTOs)

- Aggregated transmission system operated by independent system operator (ISO) whose primary functions are to provide open access to the transmission system and balance supply and demand
 - Utilities retain transmission ownership, obligations for maintenance, expansion
 - Federal Energy Regulatory Commission (FERC) sets RTO's rate and regulates
- Generation competitively bid into market
 - Some utilities have retained generation ownership
 - New entrants
 - Very loosely regulated by FERC
- Residual traditional utility, now known as Local Distribution Company (LDC), operates and maintains the wires and delivery service to retail customers
 - Under wholesale competition as vertically integrated company
 - Retains supplier role, purchasing on behalf of customers
 - Under retail competition
 - Organizes procurement of residual obligations, called Provider of Last Resort (POLR), via RFPs or auctions
 - In both approaches, performance overseen by state public utility commissions

Restructured Markets - Wholesale

Wholesale Competition- Centralized Market Design



The Verdict on Wholesale Restructuring

While many details of market design remain contested, there is broad consensus on the benefits of restructured wholesale power markets from their scale (diversity), pooled dispatch, marginal cost pricing, and coordinated transmission planning. **For example:**

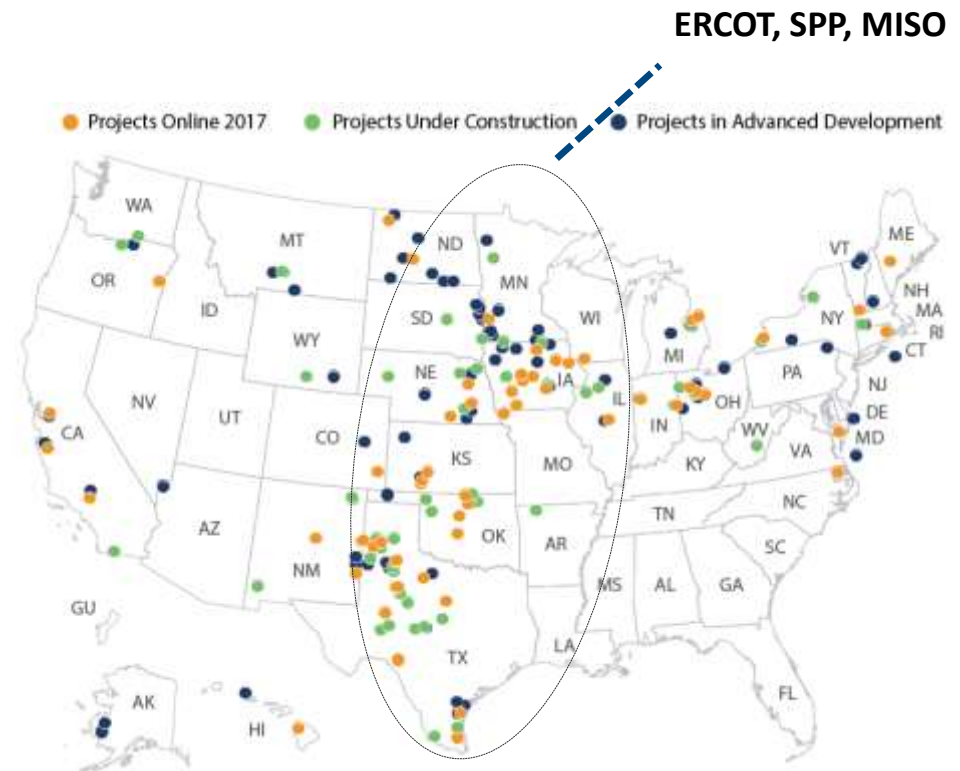
- Southwest Power Pool (SPP) and other RTO/ISO benefit studies show generation [fuel-cost savings](#) of 3-8%
- Midcontinent ISO (MISO): load and variable generation diversity in larger regional footprint offers \$1.2-1.8 billion in annual generation-related [investment-cost savings](#)
- Expanding Energy Imbalance Market (EIM) in the western U.S. has shown to significantly reduce the [cost of balancing](#) variable renewable generation
- Regional wholesale power markets have shown to accelerate growth of [demand response](#) and greatly facilitate [renewable generation investment](#) in wind-rich states
- Improved transmission access and regional planning for a larger footprint reduces the cost of achieving [state policy objectives](#)

Example: Wind Investments in RTO/ISO Markets

RTO/ISO markets account for most of recent renewable generation development

- Majority of 2017 wind additions (shown on map) are in areas that offer both favorable wind conditions and RTO membership:
 - The 7 states with the most wind generation are all in RTO/ISO markets (ERCOT, SPP, MISO)
 - Less development in similarly wind-rich areas without ISO/RTO markets (e.g., WY, CO, MT, NM)
- The RTO advantages are price visibility, liquidity, and ability to hedge

Wind Generation Projects Online & Under Construction in 2017



Source: AWEA, "U.S. Wind Industry Fourth Quarter 2017 Market Report," American Wind Energy Association, January 25, 2018.

What are some allegations about wholesale power markets failing?

Increasingly frequent debates over whether existing power markets should:

- Guard against early retirements of baseload coal and nuclear plants
- Provide incentives for a significant degree of fuel diversity
- Support certain States' public policy choices, e.g. re local job retention or environmental policy goals

Many of these are concerns that have not been demonstrated to be economical, or that can be better achieved through other mechanisms without overriding or distorting competitive market operations.

RTO markets have mostly achieved their goals of economical and reliable power supply. However, revenue/value sources of resources will shift over time even in well-designed wholesale power markets

1. Average energy prices ↓
2. Scarcity pricing ↑
3. Flexibility and reserves ↑
4. Capacity markets/resource adequacy ?
5. Clean energy attributes (where exist) ↑
6. Trade and diversification across market seams ↑

Electricity Market Restructuring: Where Are We Going?

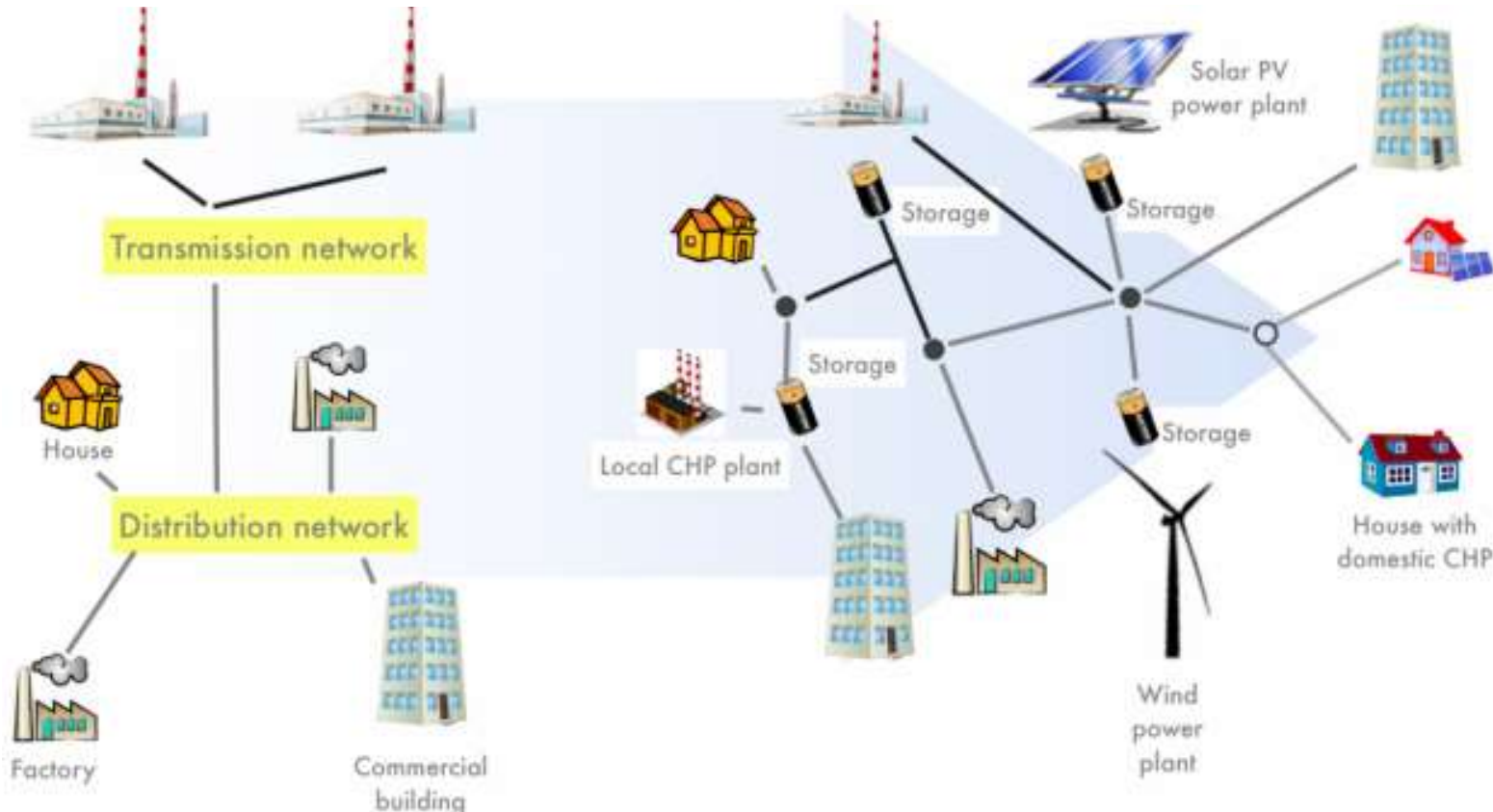
Fundamental changes in technologies and consumer preferences will drive the need for continuous evolutions in wholesale and retail market designs

Yesterday

Centralized & Integrated

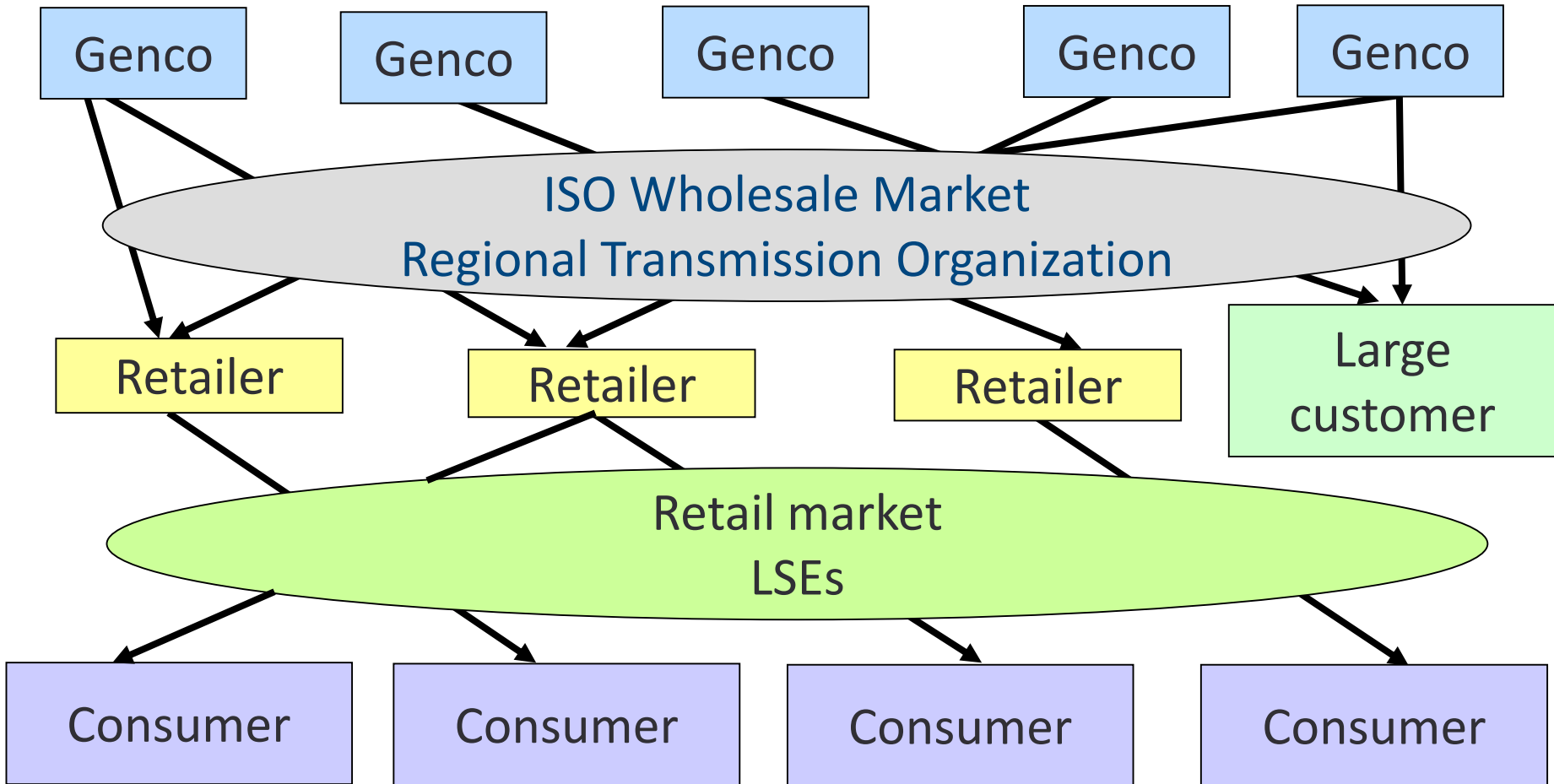
Tomorrow

More Renewable & Distributed



Restructured Markets with Retail Competition

Centralized Wholesale Market/ Decentralized Retail Market



Standardizing Some Terminology

Retail Electric Provider (“REP”) = ESCO, Retail Supplier, etc. who procure power from wholesale market for resale to end-use customers choosing a competitive supplier

Default Service (“Default”) = Standard Offer, Provider of Last Resort (POLR), Price to Beat, PUC Offer, etc. (any required backstop alternative for non-shopping or transitional customers)

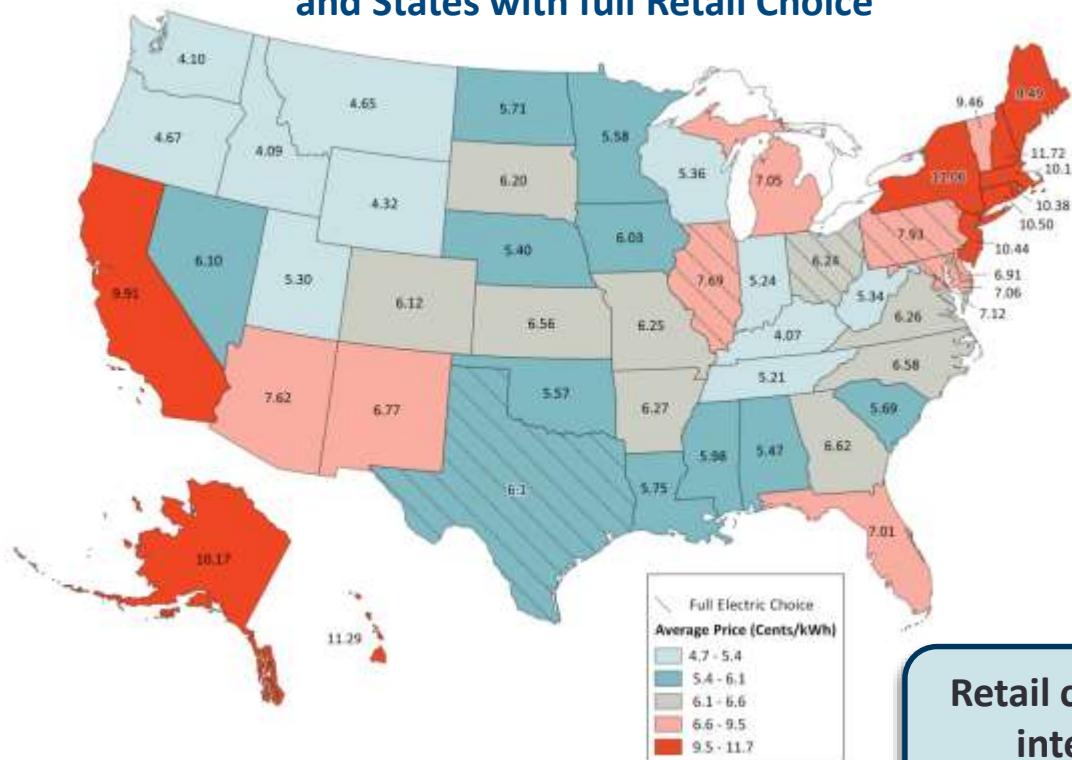
CCA = Community Choice Aggregation, or any form of opt-out municipal retail supply service

DERs = Distributed Energy Resources, i.e. customer-premise equipment to manage energy supply or use

Inception of Retail Electric Choice

From the mid-1990s through the early 2000s, several states liberalized electric markets to allow for retail electric choice

Average 1995 Retail Prices of Electricity by State (cents/kWh) and States with full Retail Choice



- The goal was to reduce consumers' electricity bills and substitute competition for regulation
- Typically states that had highest retail electricity rates in the mid-1990's were the states that implemented retail choice
- States also hoped to foster service innovations, including:
 - Billing Options
 - Hedging
 - Access to Renewable Energy

Retail choice is now facing a resurgence of interest in some states while being criticized and restricted in others.

Sources:

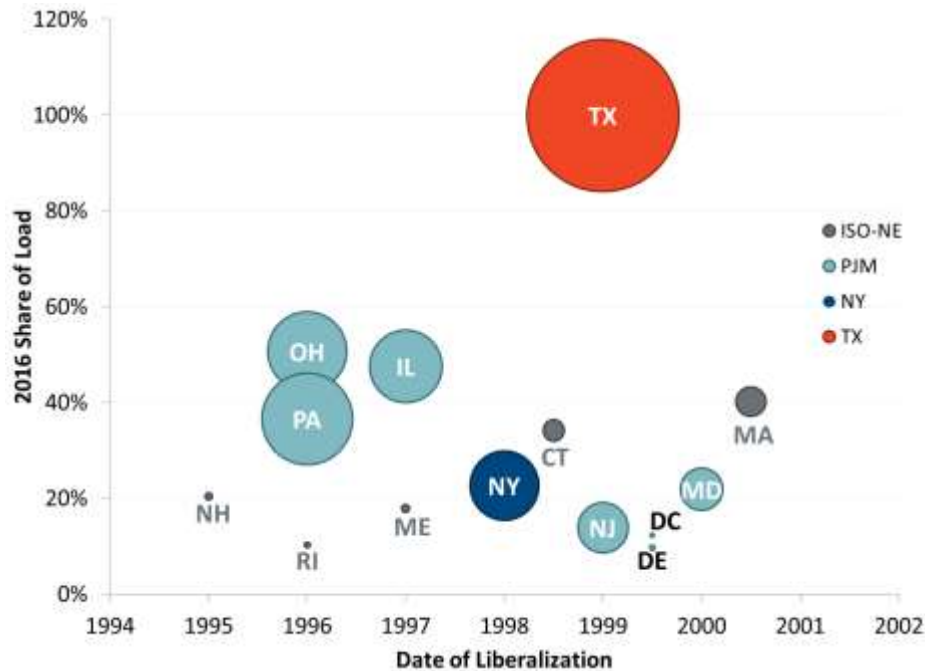
EIA, "Detailed State Data," <https://www.eia.gov/electricity/data/state/>.
Brattle Analysis.

Current Participation in Retail Electric Choice

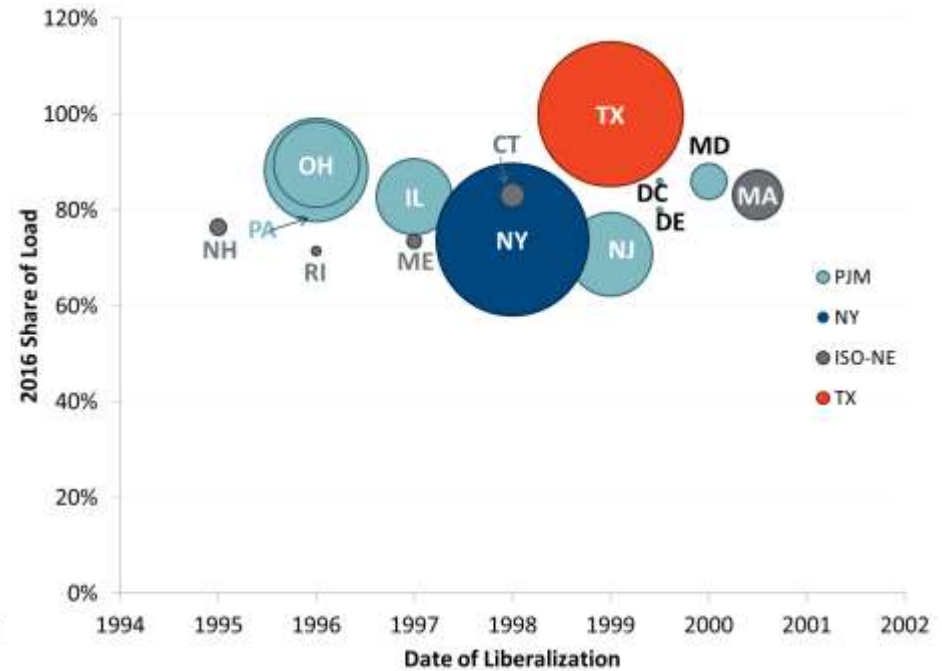
In the 13 states (and D.C.) with retail choice, 10-50% of residential and 50-75% of commercial and industrial (C&I) total eligible load are served by Retail Energy Providers (REPs)

- In Texas where there is no Default service, REPs serve 100% of both residential and C&I load

REP Share of Addressable Residential Load



REP Share of Addressable C&I Load



Notes:

- [1]: Partial competition states are not included.
- [2]: Diameter of circles reflects number of "addressable" customers in 2016.

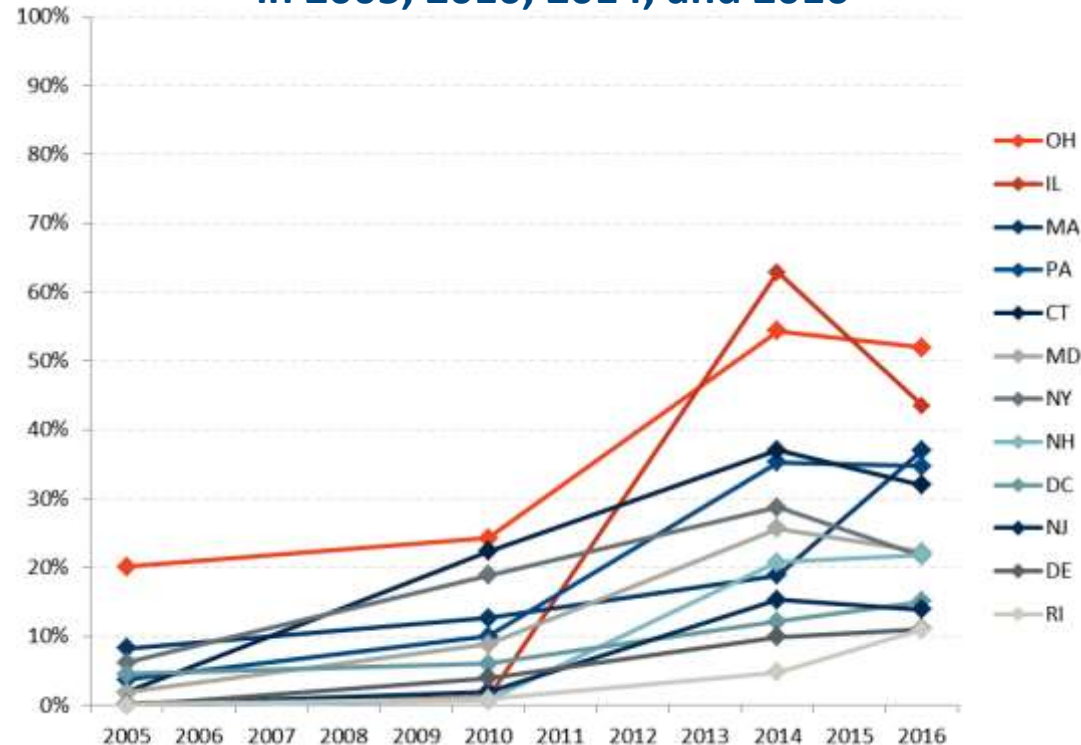
Sources: The Brattle Group and US Energy Information (EIA).

Trends in Retail Electric Choice

REPs have increased their market share in all states since 2007

- C&I customers quickly adopted retail choice as it was approved; residential adoption was slower
- Recent increases in OH, IL, and MA are attributable to Community Choice Aggregation programs*
- REP market share slightly declined in several states after the Polar Vortex in 2014

REP Share of Addressable Market in 2005, 2010, 2014, and 2016



Sources: The Brattle Group, US Energy Information Administration (EIA), Maine Public Utilities Commission

Notes:

[1] ME uses data published by the state PUC, due to anomalies in the EIA data

[2] Based on state rules addressable customers do not include customers on municipal, co-op, or state/federal agency service

[3] Texas is excluded from the figure. Texas REPs serve 100% of addressable customers

Increased Scrutiny from State Regulators

A few state attorneys general have taken the position that retail choice is harming residential customers and have recommended ending REP service to these customers

Massachusetts

In March 2018, the AG published a report which criticizes retail choice and recommends eliminating REP service to all residential customers

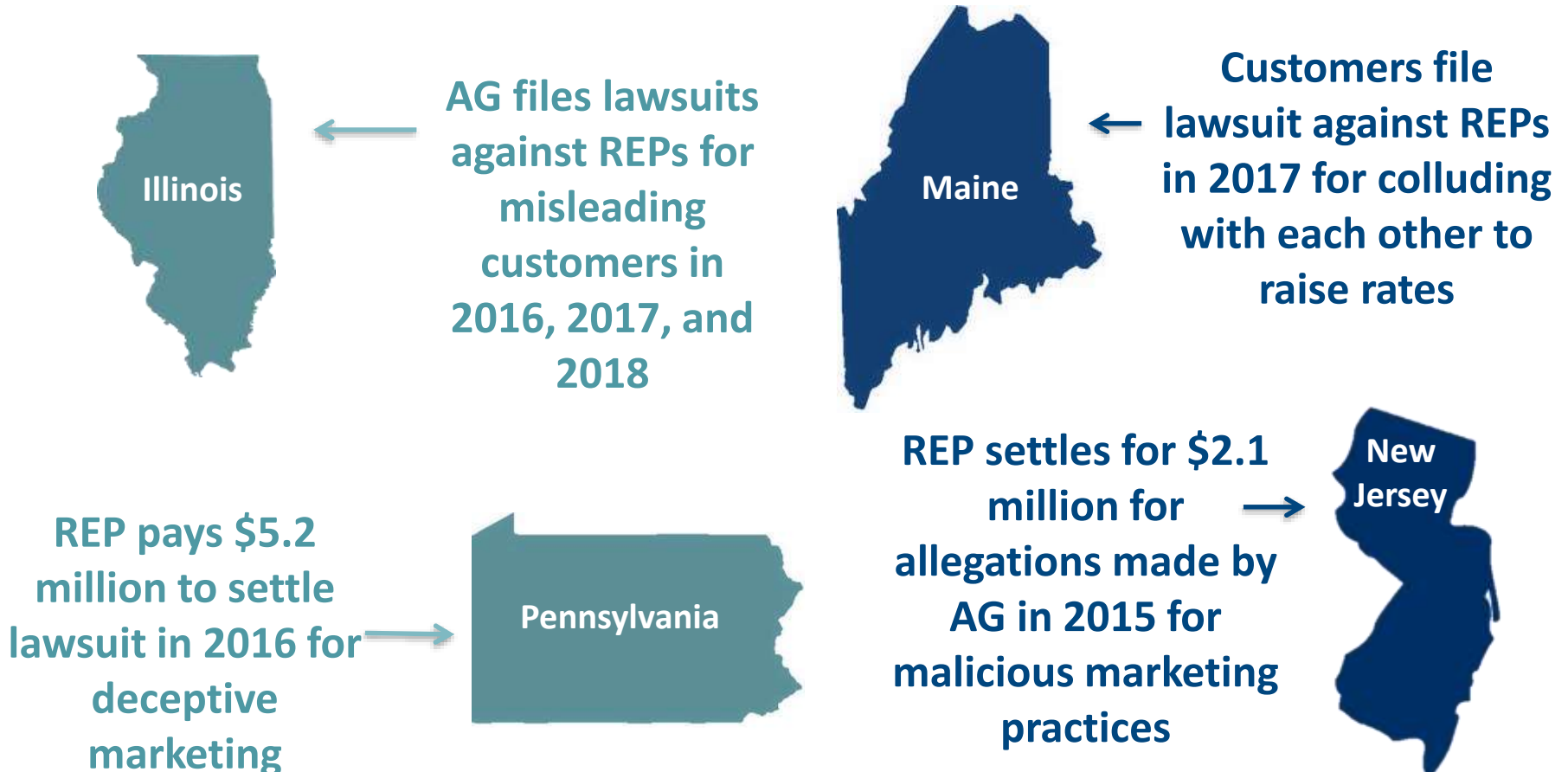
New York

The retail choice market has been under review since 2012.

REPS were restricted from serving low income customers in December 2016. Ongoing case by NY AG looking to restrict REP service to all residential customers

Enforcement against Deceptive Practices

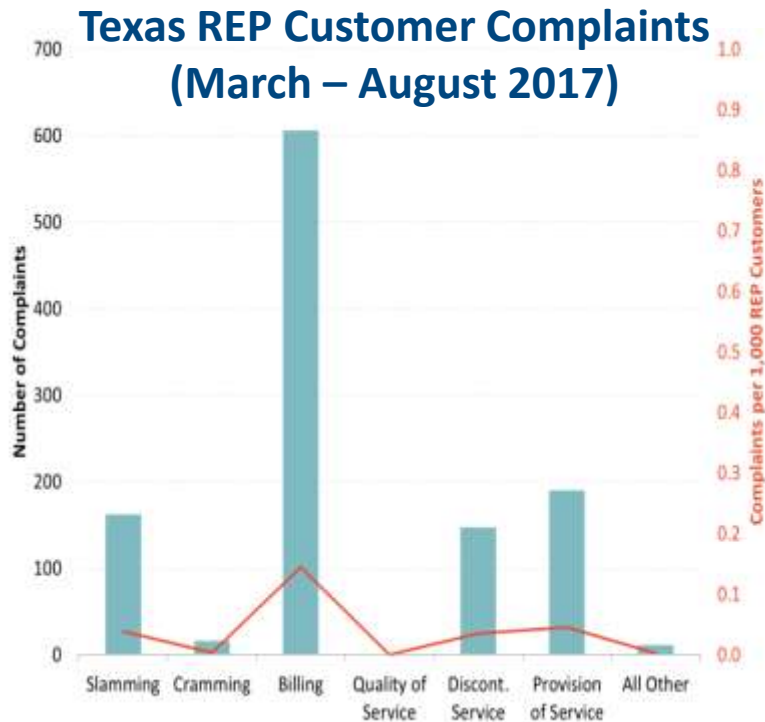
Several additional state attorneys general have taken enforcement action against specific REPs for deceptive marketing practices and misleading customers



Sources: See appendix.

Deciphering Substance of Complaints

Based on reporting by the few states that track complaints, the majority of customer complaints center on billing issues.



- Complexity or ambiguity in contract terms makes pricing difficult to understand
- Market complexity also makes evaluating performance and identifying the root cause of complaints difficult

Sources:

Public Utility Commission of Texas, "Customer Complaint Statistics,

<https://www.puc.texas.gov/consumer/electricity/CustomerComplaintStats.aspx>.

Public Utility Commission of Texas, "June 2017 Report Card on Retail Competition and Summary of Market Share Data,"

<https://www.puc.texas.gov/consumer/electricity/CustomerComplaintStats.aspx>.

Notes:

Customer complaint data is from 3/1/2017 - 8/31/2017 and number of REP customers as of June 2017.

Recap of the Issues

While there is generally agreement that Retail Choice is working for C&I customers, there is controversy around the success of, and appropriate design for, mass market services

- Some of this controversy is shaped by political views of regulation rather than by empirical economic analysis – Texas model vs. Massachusetts (or NY, etc.)
 - Many market performance analyses and commentaries are either informal, anecdotal, or rely on imprecise metrics
- The wide variety of frameworks for Retail Choice across states make performance analyses very difficult. Significant differences include:
 - Definition of Default Service – fall-back or competitive alternative?
 - Procurement for Default Service -- auctions and RFPs, utility served, various horizons
 - Quality of available customer information – Power to Choose, but very different content
 - REP versus utility relationship with the customer
 - Nature of the upstream wholesale market – one-part pricing, capacity products, ...
- New statistical and behavioral studies of comparative mass market Retail Choice performance could control for these differences.

It is very likely that there is room for improvements that would enhance the market for REPs and customers while also reassuring regulators and AGs that customers are protected.

Importance of Retail Choice: Market Innovations by REPs

REPs are innovating the market for electricity in the following ways, but adoption has been slow:

Green Power:

- In 2015, 20% of green power sold to electricity customers was a result of retail choice
- REPs offer other eco-conscious products to green customers (energy audits, home protection, carbon offsets, demand response programs)

Non-Traditional Price Structures:

- Price risk management, flat monthly billing, free night usage, and various promotions and discounts are utilized by REPs
- 4Change Energy and Gexa Energy allocate a portion of profits to charitable organizations

Bundled Services:

- Several REPs offer home automation devices in conjunction with home automation devices
- In Texas, Reliant Energy sells home security along with its energy offerings
- NRG partnered with Comcast in pilot bundling energy and broadcast service in Pennsylvania

“Retail environments are encouraging energy players and other consumer-facing customers to get creative.” - Katherine Tweed, Senior Writer at Green Tech Media

“Leading utilities are looking at how to make money from self-consumption service offerings, **not just the sale of more electrons**”- Green Tech Media*

“I come from the electric industry and there is a common wisdom there that people don’t really care about energy, **they only care about cheap energy and being there when they need it.** I now understand **this assumption is wrong.**”
- Scott Kessler, Director of Business Development at LO3 Energy*

* Emphasis added.

Sources: See appendix.

Importance of Retail Choice: Future of Distributed Energy Resources

A part of the vision for the Distributed Energy Resources (DER) revolution is allowing electricity transactions between third-parties; retail choice may provide a framework.

- Existing REPs can become agents offering DER improvements, or new companies can enter the REP market with creative new offerings
- Potential offerings tied to energy pricing, include:
 - DERs that cause load flattening or peak shifting for better terms of energy prices or reducing capacity requirements
 - Facilitating customer-to-customer or customer-to-generator transactions via REP-hosted DER aggregation and use-scheduling
- The necessary customization of these offerings will require sophisticated REPs who are able to credibly describe and appropriately account for upfront costs versus long-term savings to customers
 - Additional rules and regulations for these REPs and DER packages may be required until the mass market becomes familiar and competitive with these innovations

What Could Be Changed?

Possible Redesigns to Improve Choice

Customer protection

- Better contract comparison tools/info (beyond Power to Choose websites)?
- Standardized REP contracts (c.f. , ARM mortgages with stated indices and caps on movement)?
- Requirements to guarantee benefits or demonstrate innovation?

Design of POLR/Default Service

- High-cost fallback only, or competitive alternative?
- LMP-only to allow risk management by REPs?
- *May require metrics for monitoring quality of REP competition – none in place today*

Customer Relation

- REPs hold customer relation rather than utilities (billing, receivables' risk,...)?

Community Choice Aggregation (CCA)

- How can stranded costs be assigned? Obligation to serve? Can communities return later?

Choice in non-RTO regions

- Much more difficult to administer because of lack of FTRs and capacity markets

Conclusions

Retail Choice has had mixed success – Attractive to C&I customers who have the sophistication to evaluate and utilize it, while sometimes vulnerable to abuse for mass market customers.

- A few “bad apples” may be spoiling the barrel via slamming, obscure contracts, unreasonable fly-up pricing, etc.
- There are few empirical studies evaluating retail choice that fully correct for design differences across areas or that capture the value or fair cost of all REP services
- POLR, though protective for customers, can also be part of the problem; its design has not been fully harmonized with fostering competitive retail markets
- REPs may be needed as key players in facilitating DER adoption and future improvements in retail energy usage.

It is likely there are new positions on POLR design, product disclosure, and consumer protection that can make retail choice better.

Presenter Information



SANEM SERGICI, PH.D.

Principal | Boston, MA

Sanem.Sergici@brattle.com

+1.617.864.7900

Dr. Sanem Sergici is a Principal in The Brattle Group's Boston, MA office specializing in program design, evaluation, and big data analytics in the areas of energy efficiency, demand response, smart grid and innovative pricing. She regularly supports electric utilities, regulators, law firms, and technology firms in their strategic and regulatory questions related to retail rate design and grid modernization investments.

Dr. Sergici has been at the forefront of the design and impact analysis of innovative retail pricing, enabling technology, and behavior-based energy efficiency pilots and programs in North America. She has led numerous studies in these areas that were instrumental in regulatory approvals of Advanced Metering Infrastructure (AMI) investments and smart rate offerings for electricity customers. She also has significant expertise in development of load forecasting models; ratemaking for electric utilities; and energy litigation. Most recently, in the context of the New York Reforming the Energy Vision (NYREV) Initiative, Dr. Sergici studied the incentives required for and the impacts of incorporating large quantities of Distributed Energy Resources (DERs) including energy efficiency, demand response, and solar PVs in New York.

Dr. Sergici is a frequent presenter on the economic analysis of DERs and regularly publishes in academic and industry journals. She received her Ph.D. in Applied Economics from Northeastern University in the fields of applied econometrics and industrial organization. She received her M.A. in Economics from Northeastern University, and B.S. in Economics from Middle East Technical University (METU), Ankara, Turkey.

The views expressed in this presentation are strictly those of the presenter(s) and do not necessarily state or reflect the views of The Brattle Group, Inc.

About The Brattle Group

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governmental agencies worldwide.

We combine in-depth industry experience and rigorous analyses to help clients answer complex economic and financial questions in litigation and regulation, develop strategies for changing markets, and make critical business decisions.

Our services to the electric power industry include:

- Climate Change Policy and Planning
- Cost of Capital
- Demand Forecasting Methodology
- Demand Response and Energy Efficiency
- Electricity Market Modeling
- Energy Asset Valuation
- Energy Contract Litigation
- Environmental Compliance
- Fuel and Power Procurement
- Incentive Regulation
- Rate Design and Cost Allocation
- Regulatory Strategy and Litigation Support
- Renewables
- Resource Planning
- Retail Access and Restructuring
- Risk Management
- Market-Based Rates
- Market Design and Competitive Analysis
- Mergers and Acquisitions
- Transmission

Offices



CAMBRIDGE



NEW YORK



SAN FRANCISCO



WASHINGTON, DC



TORONTO



LONDON



MADRID



ROME



SYDNEY